Task 6.03c Biweekly Meeting Aug 22, 2017

Presentations

Papers

1) Virome 1. Method development and characterization of sewer mined wastewater and large scale collected wastewater. Submitted to JAM, but too long, resubmit to PlosOne ASAP
2) Virome 2. Focus on targeted surrogates in GW and BW (early CY18) (basis of the recent IWA ppt)
3) Virome 3: Non-targeted analysis pf GW and combined wastewater (mid CY18)
4) GW bacterial microbiome part 2. Three main elements: consistency of microbiome across different buildings, role of time in the new GW system in AWBERC (including sampling of biofilm), and comparison of the human signal alone (bucket showers) (timeline?) Do we want to roll some of this into the Jam review?
5) Model validation of Norovirus levels (end of summer. EST)
6) JAM review on human vs infrastructure microorganisms (end of CY2017)

Products

[6.03C.3] Development and implementation of on-site, non-potable water reuse guidelines, including current state of the science and the stakeholder efforts to implement policy Q4 FY18. Combination of materials from the Blue Ribbon Commission and the papers above

Research Activities

1) Model Validation/Development
    a. Sampling of MBR to define log removal of parasites (181 Fremont not likely to occur until early 2018, will follow up with Arizona prison, and Navajo nation)
2) Development of surrogates
    a. Current sampling at SFPUC (preliminary anaerobic spores evaluation)
    b. Five phage targets, one plant virus (PMMov) analysis on GW and SFPUC
    c. Culturable and total bacteria in SFPUC
3) Analysis of new alternative waters
    a. AC condensate (sampling on-going, high total culturable, Myco and Leg results pendings, sequencing at the end of sampling; 4 air handlers sampled 12 times)
        i. Reuse of water in cooling towers analyze?
    b. AWG. WaterGen visited Aug. 17-18; need to finalize SOW for CRADA
    c. Roof runoff (CSU NSF grant funded)
    d. Stormwater (need to develop modeling framework)

Budget

Next Meeting: Review SFPUC, AWBERC, Boulder sampling data with a focus on

Thoughts on Infrastructure Microbiome Paper

Focus on microbiome of the built water infrastructure

The microbiome of centralized dw and the changes within the distribution system have been increasingly studied, shedding light on the diversity of microorganism introduced into homes via water systems. In addition, there is increasing interest in reusing water of various type within homes/buildings/or even larger districts of buildings so understanding the microbiome of both the collected and reused water is of increasing importance water.

Why is microbiome or community level information of importance?

- Better defining risks
- Defining/managing risks associated with organisms which can grow in the system (e.g., Legionella, Mycio
- Defining/managing risks associated with transfer of genes amongst organisms which growth in the systems (ARGs)
- Plus unknown risks associated with the growth of organisms (e.g., toluene) (is this really an exposure risk?)
- All of these areas of concern relate to the ecology of the system, therefore warrant understanding at the community level (emphasizing the need for functional as well as structural information)
- Also require linkage of the measurements to conceptual models of the system ecology

- Development of surrogates
  - Different focus than that above
  - Defining the most commonly occurring organism also will allow for development of endogenous biological surrogates to monitor the performance of treatment systems